

What is claimed is:

1. A screen-printable adhesive composition capable of being applied to a substrate at room temperature comprising the following components:

- 5           (a) 25 to 100 parts by weight of at least one alkyl acrylate monomer;  
          (b) 0 to 75 parts by weight of at least one reinforcing comonomer; and  
          (c) an effective amount of a core-shell polymer or a semi-crystalline polymer to provide a screen-printable composition;  
          wherein said composition and components are substantially solvent free.

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2. The screen-printable adhesive composition of claim 1 wherein said composition has a yield point of greater than 3 Pascals and a viscosity of less than 6000 centipoise at 25°C.

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3. The screen-printable adhesive composition of claim 1 wherein said core-shell polymer is present in an amount of from 5 to 25 percent by weight of the screen-printable composition.

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4. The screen-printable adhesive composition of claim 3 wherein the core-shell polymer is a methacrylate/butadiene/styrene core-shell polymer.

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5. The screen-printable adhesive composition of claim 1 wherein said semi-crystalline polymer is present in an amount of from about 3 to 20 percent by weight of the screen-printable composition.

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6. The screen-printable adhesive composition of claim 5 wherein the semi-crystalline polymer is selected from the group consisting of ethylene/ethyl acrylate/glycidyl methacrylate terpolymers, ethylene/butyl acrylate/glycidyl methacrylate terpolymers, ethylene/ethyl acrylate/carbon monoxide terpolymers, and mixtures thereof.

7. The screen-printable adhesive composition of claim 1 wherein said alkyl acrylate is an unsaturated monofunctional (meth)acrylic acid ester of a non-tertiary alcohol having 4 to 18 carbon atoms in the alkyl moiety.

5 8. The screen-printable adhesive composition of claim 1 wherein said reinforcing monomer has a homopolymer glass transition temperature of greater than 25°C.

9. The screen-printable adhesive composition of claim 1 further comprising  
10 1 to 20 parts by volume of the adhesive composition of an electrically conductive material.

10. The screen-printable adhesive composition of claim 9 wherein said electrically conductive material is selected from nickel, silver, copper, or gold particles.

11. The screen-printable adhesive composition of claim 1 further comprising a  
15 thermally conductive material.

12. The screen-printable adhesive composition of claim 1 further comprising a  
thixotropic agent.

20 13. A screen-printable adhesive composition capable of being applied to a substrate at room temperature comprising acrylate polymer and monomers, and optional comonomer(s); said acrylate polymer and monomers, and optional comonomer(s) comprising the partial polymerization reaction product of:

- 25 (a) 25 to 100 parts by weight of at least one alkyl acrylate monomer;  
(b) 0 to 75 parts by weight of at least one reinforcing comonomer; and  
(c) an effective amount of at least one chain transfer agent;

wherein said composition and components (a), (b), and (c) are substantially solvent free and said acrylate polymer has a weight average molecular weight of from  
30 50,000 to 1,000,000.

14. The screen-printable adhesive composition of claim 13 wherein said chain transfer agent is present in an amount of from 0.01 to 1 pph.

15. The screen-printable adhesive composition of claim 14 wherein said chain transfer agent is selected from carbon tetrabromide, n-dodecyl mercaptan, or isooctyl thioglycolate.

16. The screen-printable adhesive composition of claim 13 further comprising 1 to 20 parts by volume of the adhesive composition of an electrically conductive material.

17. The screen-printable adhesive composition of claim 16 wherein said electrically conductive material is selected from nickel, silver, copper, or gold particles.

18. The screen-printable adhesive composition of claim 13 further comprising a thermally conductive material.

19. The screen-printable adhesive composition of claim 13 further comprising a thixotropic agent.

20. The screen-printable adhesive composition of claim 19 wherein said composition has a yield point of greater than 3 Pascals and a viscosity of less than 6000 centipoise at 25°C.